NUMERICAL STUDY OF THE RESPONSE OF A RESERVOIR DEPOSIT TO SUDDEN DAM REMOVAL

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Abstract: Dams that are filled with sediment and serve no useful purpose may be targets for removal. A dam may be removed gradually or suddenly. Here the case of sudden removal, or "blow and go" is considered. Sudden removal leads to the incision of a channel into a reservoir deposit. In many cases the incision is so rapid that the channel first narrows as it incises before it widens. A 1D formulation of incisional narrowing and widening is presented. The degree of incisional narrowing plays a role in determining the short-term efficiency with which sediment is removed from the reservoir. The case of an homogeneous, non-cohesive sediment is considered. The results of a parametric study of the erosion process as a function of varying initial width of the incisional channel are reported. The results allow for tracking of short-term variation of a) sediment delivery, b) incisional channel width and c) disposition of sediment left in the reservoir. Long-term implications for sediment removal from the reservoir and downstream delivery are also discussed.